Proposed Bacteria Criteria Updates

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Water Quality Advisory Committee

Delaware River Basin Commission
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Motivations & Drivers

Proposed Criteria

Anticipated Schedule

DRBC intends to revise (modernize) its Surface Water Quality Standards for Bacteria

- Apply to all mainstem Zones (1A through 1E, 2, 3, 4, 5, & 6)
- Revisions to Fecal Indicator Bacteria
- Revisions to numeric criteria values for *both* Primary & Secondary Contact
- *This* proposed action will **NOT** change uses
  - Different and separate from the initiative to upgrade from secondary to primary contact in select areas (Recreational Use Strategy)
  - Does not preclude changing the uses in the future

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Why the Change?

- EPA published **Recreational Water Quality Criteria** in 2012 (820-F-12-058)
  - Applicable to Primary Contact only
- *States go First* approach. State choices inform DRBC options
- EPA published **An Approach for Applying EPA's 2012 Recreational Water Quality Criteria Recommendation to Non-primary Contact Exposure Scenarios: White Paper** in 2022 (823-B-22-001)
- DRBC's existing bacteria criteria are not in alignment with EPA recommended criteria
- EPA requested Co-regulators consider in 2024

Technical counterparts in PA, NJ, DE, NY, EPA and DRBC

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Possible Candidate Criteria

Criteria Elements	Estimated Illness Rate (NGI): 36 per 1,000 primary contact recreators			Estimated Illness Rate (NGI): 32 per 1,000 primary contact recreators	
	Magnitude			Magnitude	
Indicator	GM (cfu/100 mL)[a]	STV (cfu/100 mL)[a]	OR	GM (cfu/100 mL)[a]	STV (cfu/100 mL)[a]
Enterococci – marine and fresh	35	130		30	110
OR					
E. coli – fresh	126	410		100	320
Duration and Frequency: The waterbody GM should not be greater than the selected GM magnitude in any 30-day interval. There should not be greater than a ten percent excursion frequency of the selected STV magnitude in the same 30-day interval.					

[a] EPA recommends using EPA Method 1600 (U.S. EPA, 2002a) to measure culturable enterococci, or another equivalent method that measures culturable enterococci and using EPA Method 1603 (U.S. EPA, 2002b) to measure culturable *E. coli*, or any other equivalent method that measures culturable *E. coli*.

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White Paper Methodology – Ratios of Ingestion

Table 3-96. Estimated Water Ingestion during Water Recreation Activities (mL/hr)

Activity	Surface Water Study N	Surface Water Study Median	Surface Water Study Mean	Surface Water Study UCL	Swimming Pool Study N	Swimming Pool Study Median	Swimming Pool Study Mean	Swimming Pool Study UCL
Limited Contact Scenarios								
Boating	316	2.1	3.7	11.2	0	-	-	-
Canoeing	766				76			
No capsize		2.2	3.8	11.4		2.1	3.6	11.0
With capsize		3.6	6.0	19.9		3.9	6.6	22.4
All activities		2.3	3.9	11.8		2.6	4.4	14.1
Fishing	600	2.0	3.6	10.8	121	2.0	3.5	10.6
Kayaking	801				104			
No capsize		2.2	3.8	11.4		2.1	3.6	10.9
With capsize		2.9	5.0	16.5		4.8	7.9	26.8
All activities		2.3	3.8	11.6		3.1	5.2	17.0
Rowing	222				0			
No capsize		2.3	3.9	11.8		-	-	-
With capsize		2.0	3.5	10.6		-	-	-
All activities		2.3	3.9	11.8		-	-	-
Wading/splashing	0	-	-	-	112	2.2	3.7	11.2
Walking	0	-	-	-	23	2.0	3.5	10.6
Full Contact Scenarios								
Immersion	0	-	-	-	112	3.2	5.1	15.3
Swimming	0	-	-	-	114	6.0	10.0	34.8
TOTAL	2,705				662			

N = Number of participants.
UCL = Upper confidence limit (i.e., mean + 1.96 × SD).
- = No data.

Source: Dorevitch et al. (2011).

Possible Ratio

$$\frac{I_{Primary}}{I_{Non-Primary}} = \frac{34.8}{17.0}$$

$$\approx 2.047$$

An Approach for Applying EPA's 2012 Recreational Water Quality Criteria Recommendation to Non-primary Contact Exposure Scenarios

White Paper

Office of Science and Technology

Office of Water

U. S. Environmental Protection Agency

Washington DC 20460

January 2022

Office of Water 823-B-22-001

Secondary Contact Candidate Criteria (using Primary & Ingestion Ratio)

- Overall similar levels of protectiveness

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Bact	Source	Type	Illnesses	Primary Criteria	Secondary Criteria	Description
Enterococcus	EPA	GM	32	30	61	EPA, Enterococcus, GM, 32 illnesses per 1000
E coli	EPA	GM	32	100	205	EPA, E Coli, GM, 32 illnesses per 1000
Enterococcus	EPA	STV	32	110	225	EPA, Enterococcus, STV, 32 illnesses per 1000
E coli	EPA	STV	32	320	655	EPA, E Coli, STV, 32 illnesses per 1000
Enterococcus	EPA	GM	36	35	72	EPA, Enterococcus, GM, 36 illnesses per 1000
E coli	EPA	GM	36	126	258	EPA, E Coli, GM, 36 illnesses per 1000
Enterococcus	EPA	STV	36	130	266	EPA, Enterococcus, STV, 36 illnesses per 1000
E coli	EPA	STV	36	410	839	EPA, E Coli, STV, 36 illnesses per 1000
Enterococcus	DRBC	GM	NA	NA	88	DRBC, Enterococcus, GM
FC	DRBC	GM	NA	NA	770	DRBC, FC, GM

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Elements of the Anticipated Criteria Proposal

- 36 illnesses per 1000 primary contact recreators
- E. Coli for freshwater and Enterococci for marine water
- Differentiation between freshwater and marine would be based on a spatial definition (such as RM or Zone) such that the same criteria would apply at that location regardless of conditions when the sample was collected
- GM and STV
- 30-day window (for binning data)
- At least 5 observations per assessment for GM

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Elements of the Anticipated Criteria Proposal (continued)

Ingestion rates For translating Primary to Secondary Contact

- Kayaking (all activities) for limited contact ingestion rate
- Swimming for full contact ingestion rate
  - Results in translator factor of ≈ 2.047

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Anticipated Schedule (subject to revision)

- Public Notice – Spring 2026
- Final adoption – 2026 / 2027

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